Stat and Data Analysis Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

9.0 Normal Model Review

**REVIEW from Chapter 3:**

* Normal models are symmetric and unimodal distributions.
* They are based on two numbers:

1. The mean(*μ*) of the population
2. The standard deviation(σ) of the population

* The mean is the center of the distribution.
* About 68% of the population is within 1 standard deviation above and below the mean (μ ± σ)
* About 95% of the population is within 2 standard deviations above and below the mean (μ ± 2σ)
* About 99.7% of the population is within 3 standard deviations above and below the mean (μ ± 3σ)
* We can find percentages (probabilities) of the population using the calculator: (2nd VARS)
  + The percent below a value is :
    - P(X < #) = normalcdf(-E99, #, *μ* , σ)
  + The percent above a value is :
    - P(X > #) = normalcdf( #, E99, *μ* , σ)
  + The percent between two values is :
    - P(#1 < X < #2) = normalcdf(#1, #2, *μ* , σ)
  + To find the value given a % below:
    - invNorm(%, *μ* , σ)
  + To find the value given a % above:
    - invNorm(1 – %, *μ* , σ)
* The standard score or *z*-score is the measure of the number of standard deviations a value is away from the mean.
  + 
  + Negative values are below the mean; Positive values are above the mean
  + Z scores have a mean of 0 and a standard deviation of 1
  + Unusual values are values where *z* > 2 or *z* < -2

Complete the following problems:

1. **Suppose that the weights of 30 year-old males is Normally distributed with a mean of 180 lbs and a standard deviation of 9.5 lbs.**
2. Draw the Normal model with the percentages
3. What percent of men are less than 175 lbs?
4. What percent of men are greater than 188 lbs?
5. What percent of men are between 164 and 210 lbs?
6. What weight are 60% of men below?
7. What weight are 20% of men above?
8. About 95% of men are between what two weights?
9. Would you consider the weight of 220 lbs to be unusual? Why?
10. **Length of greyhound averages 67 in with a standard deviation of 3.2 in.**
11. Draw the model
12. What percent of dogs are less than 63 in?
13. What percent of dogs are longer than 66 in?
14. What percent of dogs are between 62 and 71 in?
15. What length are the smallest 35% of dogs?
16. What length are the longest 10% of dogs?